United States Patent [19]

Burr et al.

[11] **Patent Number: 4,696,156**

[45] **Date of Patent: Sep. 29, 1987**

[54] **FUEL AND OIL HEAT MANAGEMENT SYSTEM FOR A GAS TURBINE ENGINE**

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[21] Appl. No.: **870,192**

[22] Filed: **Jun. 3, 1986**

[51] **Int. Cl.**[4] **F02C 7/06**; F02C 7/224

[52] **U.S. Cl.** **60/39.08**; 60/736

[58] **Field of Search** 60/39.02, 39.08, 39.83, 60/736; 184/6.11

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,300,965	1/1967	Sherlaw et al.	60/39.08
3,382,672	5/1968	French	60/39.281
3,779,007	12/1973	Lavash	60/39.281
4,020,632	5/1977	Coffinberry et al.	60/39.03
4,104,873	8/1978	Coffinberry	60/39.08
4,151,710	5/1979	Griffin et al.	60/39.08
4,354,345	10/1982	Dreisbach et al.	60/39.08

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[57] **ABSTRACT**

A heat management system is provided for a gas turbine engine (**10**) having first and second oil cooling loops (**14, 16**). The system distributes excess fuel flow from a main fuel pump (**44**) among a plurality of upstream locations (**58, 60, 68**) for managing the transfer of heat between the oil loops (**14, 16**) and the flowing fuel. A diverter valve (**62**) regulates the distribution of the bypass fuel responsive to engine heat generation, oil temperature, and/or fuel temperature. A passive fuel distribution configuration using one or more fuel flow restrictors (**72, 74, 76**) is also disclosed.

7 Claims, 2 Drawing Figures